

WE CLAIM:

1. A method comprising:
a computing node in a network creating a description of a data volume layout,
wherein the data volume is composed from two or more data storage devices
on the network;
first, second and third devices storing a copy of the data volume layout description or
respective modified versions thereof in respective memories of the first,
second and third devices;
transmitting data input/output (I/O) transactions between the first device and the
second device;
transmitting data (I/O) transactions between the first device and the third device.
2. The method of claim 1 wherein the data volume layout description relates
virtual storage objects of the data volume to other virtual storage objects of the data volume.
3. The method of claim 1 wherein the data volume layout description relates
virtual storage objects of the data volume to one or more data storage systems of the network.
4. The method of claim 1 wherein the first device comprises a host node, wherein
the second device comprises a first data storage system that stores a first portion of data of
the data volume, and wherein the third device comprises a second data storage system that
stores a second portion of data of the data volume.
5. The method of claim 1 wherein the computing node is contained within the
first, second, or third device.
6. The method of claim 1 wherein the first device comprises a host node, wherein
second device comprises a data storage system that stores a portion of data of the data
volume, and wherein the third device comprises a switch coupled between the host node and
the data storage system.

7. The method of claim 4 further comprising:
the host node generating a write I/O transaction to write new data, wherein the write I/O transaction comprises the new data;
the host node transmitting the write I/O transaction to only the first data storage system;
after receiving the write I/O data transaction, the first data storage system generating another transaction to write the new data;
the first data storage system transmitting the other transaction to the second data storage system.

8. The method of claim 7 further comprising the first data storage system accessing the data volume layout description or the modified version thereof stored in memory of the first data storage system in response to receiving the write I/O transaction.

9. The method of claim 8 further comprising the second data storage system accessing the data volume layout description or the modified version thereof stored in memory of the second data storage system in response to receiving the other transaction.

10. The method of claim 4 further comprising:
the host node generating a write I/O transaction to write new data, wherein the write I/O transaction comprises the new data;
the host node transmitting the write I/O transaction to the first data storage system;
after receiving the write I/O data transaction, the first data storage system accessing the data volume layout description or the modified version thereof stored in memory of the first data storage system;
after accessing the data volume layout description or the modified version thereof stored in memory of the first data storage system, the first data storage system writing all the new data to separate memory locations within the first data storage system.

11. The method of claim 1 further comprising:
the computing node modifying the data volume layout description;
the first, second and third devices overwriting their respective data volume layout descriptions or their respective modified versions of the data volume layout descriptions with a copy of the modified data volume layout description or the respective modified versions thereof.
12. A computer readable medium storing computer executable instructions, wherein a method is performed by a first device within a network in response to the first device executing the computer executable instructions, the method comprising:
the first device transmitting a first copy of a description of a data volume layout or a modified first copy of the data volume layout description to a second device in the network, wherein data of the data volume is stored in two or more data storage systems of the network;
the first device transmitting a second copy of the data volume layout description or a modified second copy of the data volume layout description to a third device in the network;
the first device transmitting input/output (I/O) transactions to the second and third devices.
13. The computer readable medium of claim 12 wherein the data volume layout description relates virtual storage objects of the data volume to other virtual storage objects of the data volume.
14. The computer readable medium of claim 12 wherein the data volume layout description relates virtual storage objects of the data volume to one or more data storage systems of the network.
15. The computer readable medium of claim 12 wherein the first device comprises a host node, wherein the second device comprises a first data storage system that stores a first portion of data of the data volume, and wherein the third device comprises a second data storage system that stores a second portion of data of the data volume.

16. The computer readable medium of claim 15 wherein the method further comprises:

the host node generating a write I/O transaction to write new data, wherein the write I/O transaction comprises the new data;
the host node transmitting the write I/O transaction to only the first data storage system.

17. The computer readable medium of claim 12 wherein the method further comprises:

the first device modifying the data volume layout description to create a modified data volume layout description;
the first device transmitting a copy of the modified data volume layout description or a modified version thereof to the second device.

18. A computer readable medium storing instructions, wherein the instructions are executable by a processor in a second device in a network containing a first device, the second device, and a third device, wherein the network stores a data volume, wherein the first device is configured to transmit I/O transactions to the second device, and wherein the first device is configured to transmit I/O transactions to the third device, the method comprising:

the second device receiving and storing in memory thereof, a description of a data volume layout created and transmitted by the first data device;
the second device receiving an write I/O transaction from the first device, wherein the write I/O transaction comprises data D;
after receiving the write I/O transaction, the second device generating another transaction to write data D;
the second device transmitting the other transaction to the third device.

19. A computer readable medium storing instructions, wherein the instructions are executable by a processor in a second device in a network containing a first device, the second device, and a third device, wherein the network stores a data volume, wherein the first device is configured to transmit I/O transactions to the second device, and wherein the first device is configured to transmit I/O transactions to the third device, the method comprising:

the second device receiving and storing in memory thereof, a description of a data volume layout created and transmitted by the first data device;

the second device receiving an write I/O transaction from the first device, wherein the write I/O transaction comprises data D

in response to receiving the write I/O data transaction, the first second device accessing the data volume layout description or the modified version thereof stored in memory of the first device;

in response to accessing the data volume layout description or the modified version thereof stored in memory of the second device, the second device writing data D to separate memory locations within the second device.

20. A network comprising:

a first device coupled to second and third devices, wherein the first device is configured to transmit I/O data transactions to the second and third devices; wherein the first device is configured to create a description of a data volume layout, wherein data of the data volume is stored in two or more data storage systems of the network;

wherein the first device is configured to store the data volume layout description in memory of the first device;

wherein the second and third devices are configured to store a copy of the data volume layout description or respective modified versions thereof in respective memories of the second and third devices.